REMARKS/ARGUMENTS

In the Office Action dated November 17, 2003, the Examiner (1) rejected claims 1, 4, 6, 8, 9, 13, and 15 under 35 U.S.C. § 102(b) and (2) rejected claims 5, 10, 11, 12, 14, and 16 under 35 U.S.C. § 103(a). Further, the Examiner withdrew the rejection under the judicially created doctrine of obviousness-type double patenting in view of the terminal disclaimer filed on August 28, 2003. Claims 1, 12, and 13 have been amended to more distinctly claim the invention. New claim 18 has been added. No new matter has been added.

1. Response to the 35 U.S.C. § 102(b) Rejections

Claims 1, 4, 6, 8, 9, 13, and 15 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,964,952 ("Kunze-Concewitz"). In claim 1, Applicants recite a method of removing a liquid from a surface of a substrate. The method includes supplying a liquid to the substrate surface. The liquid is locally heated to remove at least a portion of the liquid and create a liquid-ambient boundary. The liquid-ambient boundary separates a liquid-covered region and a liquid-removed region on the substrate. The liquid-ambient boundary is guided over the substrate. As the liquid-ambient boundary is guided over the substrate, the portion of the substrate on the liquid-removed region of the liquid-ambient boundary is increased. In this manner, as the liquid-ambient boundary moves, more of the liquid is removed from the substrate surface.

Similarly in claim 13, Applicants recite an apparatus for removing a liquid from a surface of a substrate. The apparatus includes a liquid supply system for applying a liquid on a substrate surface and a heat source for heating and removing the liquid. The heat source and the liquid supply system are positioned so that the heating is applied closer to the center of the rotary movement than the

liquid. This positioning creates a liquid-ambient boundary, which separates a liquid-covered region and a liquid-removed region on the substrate.

In contrast, Kunze-Concewitz describes a cleaning method in which a water film is sprayed onto a contaminated substrate surface and then a spray nozzle sweeps over a substrate surface spraying steam into the water film. (See, e.g., Kunze-Concewitz, column 6, lines 46-61.) By spraying the steam into the water film, vapor bubbles form, which loosen contaminants from the surface. Kunze-Concewitz further describes that the surface is dried at the end. (See, e.g., Kunze-Concewitz, column 2, lines 49-52.) The surface is dried by the introduction of a foreign gas, employing hot steam, or using a spin dryer. (See, e.g., Kunze-Concewitz, column 2, lines 49-52 and Claim 8.)

The Office Action states that Kunze-Concewitz's method inherently creates a liquid-ambient boundary. (See Office Action, page 3.) However, Applicants respectfully submit that the Kunze-Concewitz method described does not create a liquid-ambient boundary, as claimed, that separates a liquid-covered region and a liquid-removed region on the substrate.

Kunze-Concewitz describes a cleaning method that includes applying a water film on the substrate surface. After the described cleaning process, the substrate is then dried. (See, e.g., Kunze-Concewitz, column 2, lines 49-52.) Thus, Kunze-Concewitz describes a two-step process: first cleaning and then, subsequently drying. In contrast, Applicants claim a one-step process of cleaning while removing liquid from the surface of a substrate.

Because Kunze-Concewitz is not concerned with removing liquids from the substrate surface as part of the cleaning process, Kunze-Concewitz has no reason to separate a liquid-covered region from a liquid-removed region on the substrate. Accordingly, Kunze-Concewitz does not teach creating a liquid-ambient boundary separating a liquid-covered region from a liquid-removed region

on the substrate. Consequently, Kunze-Concewitz also does not teach guiding such a liquid-ambient boundary over the substrate.

Because Kunze-Concewitz does not show or suggest at least creating a liquid-ambient boundary on the substrate or guiding the liquid-ambient boundary over the substrate, Kunze-Concewitz does not anticipate claims 1 and 13.

Claims 4, 6, 8, and 9 depend from claim 1. Claim 15 depends from claim 13. Accordingly, Applicants also respectfully submit that Kunze-Concewitz does not anticipate claims 4, 6, 8, 9, and 13 for at least the reasons set forth above.

In light of the above, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 102(b).

2. Response to the 35 U.S.C. § 103(a) Rejections

Claims 5, 10, 11, and 14 were rejected under 35 U.S.C. § 103(a) as being obvious in light of the combination of Kunze-Concewitz and U.S. Patent No. 5,271,774 ("Leenaars"). Claims 5, 10, and 11 depend from claim 1. Claim 14 depends from claim 13.

Leenaars describes a method for removing a liquid from a surface of a substrate in a centrifuge. (See, e.g., Leenaars, Abstract.) A vapor is introduced into the centrifuge, causing the quantity of material remaining on the substrate to be reduced. (See, e.g., Leenaars, Abstract.) However, Leenaars does not show or suggest creating a liquid-ambient boundary on the substrate or guiding the liquid-ambient boundary over the substrate. In fact, the Examiner cite Leenaars merely with regard to Leenaars use of a turntable rotating at 5 to 8 revolutions per second. The Examiner does not rely on Leenaars for teaching the creation of a liquid-ambient boundary on the substrate or

guiding the liquid-ambient boundary over the substrate. Accordingly, Leenaars fails to overcome the deficiencies described above with respect to Kunze-Concewitz.

Because neither Kunze-Concewitz nor Leenaars show or suggest creating a liquid-ambient boundary on the substrate or guiding the liquid-ambient boundary over the substrate, the combination of Kunze-Concewitz and Leenaars does not show or suggest every element of claims 5, 10, 11, and 14. Accordingly, Applicants believe that claims 5, 10, 11, and 14 are not obvious in light of the combination of Kunze-Concewitz and Leenaars for at least the reasons set forth above.

Claim 12 was rejected under 35 U.S.C. § 103(a) as being obvious in light of the combination of Kunze-Concewitz and the knowledge of one skilled in the art. In claim 12, Applicants recite a method of removing a liquid from a first surface and a second surface of a substrate. The method includes supplying a liquid to the first and second surfaces of the substrate. The liquid is locally heated to remove the liquid, which reduces the surface tension of the liquid. A surface tension gradient is formed in the liquid that is in a direction away from a liquid-ambient boundary that is created on the substrate. The liquid-ambient boundary separates a liquid-covered region and a liquid-removed region on the substrate. The liquid-ambient boundary is guided over the substrate. As described above, Kunze-Concewitz does not show or suggest creating a liquid-ambient boundary on the substrate or guiding the liquid-ambient boundary over the substrate.

Because Kunze-Concewitz fails to show or suggest creating a liquid-ambient boundary on the substrate or guiding the liquid-ambient boundary over the substrate, the combination of Kunze-Concewitz and the knowledge of one skilled in the art does not teach, suggest or describe every element of claim 12. Accordingly, Applicants respectfully submit that claim 12 is not obvious in light of the combination of Kunze-Concewitz and the knowledge of one skilled in the art for at least the reasons set forth above.

McDonnell Boehnen Hulbert & Berghoff
300 South Wacker Drive
Chicago, Illinois 60606
(312) 913-0001

Claim 16 was rejected under 35 U.S.C. § 103(a) as being obvious in light of the combination of Kunze-Concewitz and U.S. Patent No. 6,106,635 ("Hamada"). Claim 16 depends from claim 13.

Hamada describes a washing method for removing dust from a workpiece. (See, e.g., Hamada, Abstract.) The method includes placing a brushing arm on a rotating substrate while applying a rinsing liquid to the substrate. (See, e.g., Hamada, column 4, lines 38-42.) However, Hamada does not show or suggest creating a liquid-ambient boundary on the substrate or guiding the liquid-ambient boundary over the substrate. Accordingly, Hamada fails to overcome the deficiencies described above with respect to Kunze-Concewitz.

Because neither Kunze-Concewitz nor Hamada show or suggest creating a liquid-ambient boundary on the substrate or guiding the liquid-ambient boundary over the substrate, the combination of Kunze-Concewitz and Hamada does not show or suggest every element of claim 16. Accordingly, Applicants respectfully submit that claim 16 is not obvious in light of the combination of Kunze-Concewitz and Hamada for at least the reasons set forth above.

In light of the above, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103(a).

In light of the above amendments and remarks, Applicants submit that the present application is in condition for allowance and respectfully request notice to this effect. The Examiner is requested to contact Applicants' representative below at 360.379.6514 if any questions arise that may be resolved via telephone.

Respectfully Submitted,

McDonnell Boehnen Hulbert & Berghoff

Date: March 17, 2004 By: Paul W. Churilla

Paul W. Churilla
Reg. No. 47,495

McDonnell Boehnen Hulbert & Berghoff
300 South Wacker Drive
Chicago, Illinois 60606
(312) 913-0001